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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/544,251	10/12/2006	Erwan Pincemin	2085-100US	2372

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EPSTEIN DRANGEL BAZERMAN & JAMES, LLP
60 EAST 42ND STREET
SUITE 820
NEW YORK, NY 10165

EXAMINER	
CURS, NATHAN M	

ART UNIT	PAPER NUMBER
2613	

MAIL DATE	DELIVERY MODE
10/30/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/544,251	PINCEMIN, ERWAN	
	Examiner	Art Unit	
	NATHAN M. CURS	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *22 July 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *11-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *11-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 October 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 11, 15, 16, and 18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stock et al. ("Stock") (US Patent No. 6249630) in view of Moeller (US Patent Application Publication No.2004/0062552) and further in view of Harstead et al. ("Harstead") (US Patent No. 5912749).

Regarding claim 11, Stock discloses apparatus for transmitting a signal through an optical transmission network (fig. 1 and col. 6 lines 28-40), the apparatus comprising a pulse emitter and at least one line fiber for conveying at least one pulse in said line fiber (fig. 1 elements 10 and 30 and col. 6 lines 41-51), wherein the apparatus comprises a spreader module for spreading pulses, said spreader module comprising a propagation medium that is dispersive, said propagation medium presenting accumulated chromatic dispersion (fig. 1 element 20 and col. 6 lines 41-49, where the optical fiber of the pulse stretcher is inherently dispersive presenting accumulated chromatic dispersion) that is high enough to lower the peak power of the pulse to below a predetermined threshold, where a signal above said threshold is liable to be subjected to non-linear distortion in the line fiber (col. 5 lines 33-39, col. 6 lines 48-49 and col. 8

lines 15-29, where the predetermined threshold is the power level that the pulse power is reduced from in order to avoid non-linear effects), said spreader module being disposed between the emitter and the line fiber. Stock does not specifically disclose that the optical transmission network is a data transmission network. Moeller discloses an optical data transmission system where pulse peak power is reduced to avoid non-linear effects and extend optical communication. Since Moeller reveals that pulse peak power reduction can also be used in an optical data communication system to avoid non-linear effects, increase transmission performance, and extended communication, one of ordinary skill in the art at the time of the invention could have modified Stock to transmit data from the source point to the destination point, and the results would have been predictable. Namely, the system would provide optical data communication. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Stock to transmit data from the source point to the destination point, for the predictable result of the system providing optical data communication.

Also, Stock does not explicitly disclose that the pulse spreading is linear, the propagation medium being linear. However, Harstead discloses linearly spreading optical pulses using a linear dispersion fiber (col. 4 lines 8-12). Since Harstead linear dispersion fiber and the fiber of Stock's stretcher both spread optical pulses, one of ordinary skill in the art at the time of the invention could have substituted linear dispersion fiber like that of Harstead for the fiber of Stock's stretcher, and the results would have been predictable; namely, the linear dispersion fiber would spread the pulses as required. Therefore, it would have been obvious to one of ordinary skill in the

art at the time of the invention to substitute linear dispersion fiber like that of Harstead for the fiber of Stock's stretcher, for the predictable result of the linear dispersion fiber spreading the pulses as required.

Regarding claim 15, the combination of Stock, Moeller and Harstead discloses the use of apparatus according to claim 11, and discloses optical pulse widths of less than 100 ps (Stock: col. 6 lines 34-36), but does not disclose that the data rate is not less than 160 Gbit/s. However, a data rate of not less than 160 Gbit/s is equal to a bit interval of not more than 6.25 ps. The disclosed pulse widths of the combination of less than 100 ps overlap with the claimed bit interval of 6.25 ps. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a data rate of 160 Gbit/s for the data transmission of the combination, because where claimed ranges overlaps or lie inside ranges disclosed by the prior art, a prima facie case of obviousness exists (see MPEP § 2144.05).

Regarding claim 16, Stock discloses a method of transmitting a signal through an optical transmission network (fig. 1 and col. 6 lines 28-40), the method comprising the steps consisting in emitting at least one pulse and in conveying said pulse via an optical transmission network comprising at least one line fiber (fig. 1 elements 10 and 30 and col. 6 lines 41-51), wherein the method further comprises, prior to conveying the pulse to the line fiber, a step consisting in causing the pulse to be conveyed by a propagation medium that is dispersive, said propagation medium presenting accumulated chromatic dispersion (fig. 1 element 20 and col. 6 lines 41-49, where the optical fiber of the pulse stretcher is inherently dispersive presenting accumulated chromatic dispersion) that is

high enough to lower the peak power of the pulse to below a predetermined threshold, where a signal above said threshold is liable to be subjected to non-linear distortion in the line fiber (col. 5 lines 33-39, col. 6 lines 48-49 and col. 8 lines 15-29, where the predetermined threshold is the power level that the pulse power is reduced from in order to avoid non-linear effects). Stock does not specifically disclose that the optical transmission network is a data transmission network. Moeller discloses an optical data transmission system where pulse peak power is reduced to avoid non-linear effects and extend optical communication. Since Moeller reveals that pulse peak power reduction can also be used in an optical data communication system to avoid non-linear effects, increase transmission performance, and extended communication, one of ordinary skill in the art at the time of the invention could have modified Stock to transmit data from the source point to the destination point, and the results would have been predictable. Namely, the system would provide optical data communication. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify Stock to transmit data from the source point to the destination point, for the predictable result of the system providing optical data communication.

Also, Stock does not explicitly disclose that the propagation medium is also linear. However, Harstead discloses linearly spreading optical pulses using a linear dispersion fiber (col. 4 lines 8-12). Since Harstead linear dispersion fiber and the fiber of Stock's stretcher both spread optical pulses, one of ordinary skill in the art at the time of the invention could have substituted linear dispersion fiber like that of Harstead for the fiber of Stock's stretcher, and the results would have been predictable; namely, the

linear dispersion fiber would spread the pulses as required. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to substitute linear dispersion fiber like that of Harstead for the fiber of Stock's stretcher, for the predictable result of the linear dispersion fiber spreading the pulses as required.

Regarding claim 18, the combination of Stock, Moeller and Harstead discloses the use of a method according to claim 16, and discloses optical pulse widths of less than 100 ps (Stock: col. 6 lines 34-36), but does not specifically disclose transmission at a data rate of not less than 160 Gbit/s. However, a data rate of not less than 160 Gbit/s is equal to a bit interval of not more than 6.25 ps. The disclose pulse widths of the combination of less than 100 ps overlap with the claimed bit interval of 6.25 ps. It would have been obvious to one of ordinary skill in the art at the time of the invention to use a data rate of 160 Gbit/s for the data transmission of the combination, because where claimed ranges overlaps or lie inside ranges disclosed by the prior art, a prima facie case of obviousness exists (see MPEP § 2144.05).

3. Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stock (US Patent No. 6249630) in view of Moeller (US Patent Application Publication No. 2004/0062552) and further in view of Harstead (US Patent No. 5912749) as applied to claims 11, 15, 16, and 18 above, and further in view of Johnson et al. ("Johnson") (US Patent Application Publication No. 2002/0176676).

Regarding claim 12, the combination of Stock, Moeller and Harstead discloses transmission apparatus according to claim 11, but does not specifically disclose that the

spreader module comprises a fiber of the high order mode type, of the super large area type, or having photonic crystals. Johnson discloses using photonic crystal waveguides for tailored dispersion profile waveguides (abstract and paragraph 0008). One of ordinary skill in the art at the time of the invention could have used a tailored photonic crystal waveguide for the waveguide of the stretcher of the combination, and the results would have predictable; namely, the dispersion profile of the waveguide would be tailored to provide the necessary amount of dispersion to stretch the pulses. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a tailored photonic crystal waveguide for the waveguide of the stretcher of the combination, the predictable result of providing the necessary amount of dispersion to stretch the pulses used a tailored waveguide.

4. Claims 13 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stock (US Patent No. 6249630) in view of Moeller (US Patent Application Publication No. 2004/0062552) and further in view of Harstead (US Patent No. 5912749) as applied to claims 11, 15, 16, and 18 above, and further in view of Bai (US Patent Application Publication No. 2002/0036812).

Regarding claim 13, the combination of Stock, Moeller and Harstead discloses transmission apparatus according to claim 11, but does not disclose that it includes a plurality of amplifier modules disposed regularly along the line fiber, each including a dispersion compensation module comprising a propagation medium that is dispersive and linear. Bai discloses using an optical amplifier with a linear dispersion compensator

for each span of a transmission line, to compensate for dispersion of the transmission line affecting the optical pulses and to maintain intensity of the optical pulses (figs. 1 and 2 and paragraph 0030). It would have been obvious to one of ordinary skill in the art at the time of the invention to use multiple spans in the transmission line of the combination, each span with an amplifier plus linear dispersion compensator, to provide the benefit of compensating for dispersion of the line and maintaining intensity of the optical pulses. The combination as described above does not specifically disclose the dispersion compensator and optical amplifier as a single module. However, the Office takes official takes official notice that it's well known to group in-line optical amplifiers and in-line dispersion compensators into the same module or circuit pack. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to group in-line optical amplifiers and in-line dispersion compensators into the same module or circuit pack, to provide the benefit of reducing the number of different physical components and optimizing equipment space requirements.

Regarding claim 17, the combination of Stock, Moeller and Harstead discloses a transmission method according to claim 16, but does not disclose that a transmitted pulse is amplified by amplifier modules disposed regularly along the line fiber, or that the pulse is conveyed within the amplifier modules in a propagation medium that is dispersive and linear in order to compensate the dispersion to which the pulse has been subjected in the line fiber. Bai discloses using an optical amplifier with a linear dispersion compensator for each span of a transmission line, to compensate for dispersion of the transmission line affecting the optical pulses and to maintain intensity

of the optical pulses (figs. 1 and 2 and paragraph 0030). It would have been obvious to one of ordinary skill in the art at the time of the invention to use multiple spans in the transmission line of the combination, each span with an amplifier plus linear dispersion compensator, to provide the benefit of compensating for dispersion of the line and maintaining intensity of the optical pulses. The combination as described above does not specifically disclose the dispersion compensator and optical amplifier as a single module. However, the Office takes official takes official notice that it's well known to group in-line optical amplifiers and in-line dispersion compensators into the same module or circuit pack. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to group in-line optical amplifiers and in-line dispersion compensators into the same module or circuit pack, to provide the benefit of reducing the number of different physical components and optimizing equipment space requirements.

5. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stock (US Patent No. 6249630) in view of Moeller (US Patent Application Publication No. 2004/0062552) and further in view of Harstead (US Patent No. 5912749), and further in view of Bai (US Patent Application Publication No. 2002/0036812) as applied to claims 13 and 17 above, and further in view of Johnson (US Patent Application Publication No. 2002/0176676).

Regarding claim 14, the combination of Stock, Moeller, Harstead and Bai discloses transmission apparatus according to claim 13, but does not specifically

disclose that the dispersion compensation module comprises a fiber of the high order mode type, the super large area type, or having photonic crystals. Johnson discloses using photonic crystal waveguides for tailored dispersion profile waveguides (abstract and paragraph 0008). One of ordinary skill in the art at the time of the invention could have used a tailored photonic crystal waveguide for the waveguide of the stretcher of the combination, and the results would have predictable; namely, the dispersion profile of the waveguide would be tailored to provide the necessary amount of dispersion to stretch the pulses. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to use a tailored photonic crystal waveguide for the waveguide of the stretcher of the combination, the predictable result of providing the necessary amount of dispersion to stretch the pulses used a tailored waveguide.

6. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stock (US Patent No. 6249630) in view of Harstead (US Patent No. 5912749).

Regarding claim 19, Stock discloses a module comprising a propagation medium that is dispersive (fig. 1 element 20 and col. 6 lines 41-49, where the optical fiber of the pulse stretcher is inherently dispersive), said module being disposed between a pulse emitter and a line fiber in order to transmit pulses into the line and to spread pulses (fig. 1 elements 10 and 30 on either side of element 20 and col. 6 lines 41-49), with the accumulated chromatic dispersion of said module being high enough to lower the peak power of pulses to below a predetermined threshold, above which the signal is subjected to distortion (col. 5 lines 33-39, col. 6 lines 48-49 and col. 8 lines 15-29,

where the amount dispersion reduces the level of pulse power in order to avoid non-linear effects). Stock does not explicitly disclose that the propagation medium is also linear. However, Harstead discloses linearly spreading optical pulses using a linear dispersion fiber (col. 4 lines 8-12). Since Harstead linear dispersion fiber and the fiber of Stock's stretcher both spread optical pulses, one of ordinary skill in the art at the time of the invention could have substituted linear dispersion fiber like that of Harstead for the fiber of Stock's stretcher, and the results would have been predictable; namely, the linear dispersion fiber would spread the pulses as required. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to substitute linear dispersion fiber like that of Harstead for the fiber of Stock's stretcher, for the predictable result of the linear dispersion fiber spreading the pulses as required.

7. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bai (US Patent Application Publication No. 2002/0036812).

Regarding claim 20, Bai discloses an amplifier module in a line fiber for transmitting pulses into the line, said amplifier arrangement comprising pulse amplifier means and a compensation module comprising a propagation medium that is dispersive and linear in order to increase the peak power and reduce the width of the pulses (figs. 1 and 2 and paragraph 0030, where compensating for dispersion and maintaining intensity of optical pulses indicates that the pulses arriving at the arrangement are spread out and reduced due to dispersion and the compensation and amplifier reduce the pulse width and increase the pulse power back to the desired level). Bai does not

specifically disclose the dispersion compensator and optical amplifier as a single module. However, the Office takes official takes official notice that it's well known to group in-line optical amplifiers and in-line dispersion compensators into the same module or circuit pack. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to group in-line optical amplifiers and in-line dispersion compensators into the same module or circuit pack, to provide the benefit of reducing the number of different physical components and optimizing equipment space requirements.

Response to Arguments

8. Applicant's arguments filed 2 August 2005 have been fully considered but they are not persuasive.

In the Remarks page 6 lines 4-5, Applicant asserts that the pulses of Stock are only transmitted over short distances. "Short" is a relative term, however, and Stock in fact does not disclose a specific distance, stating that the fiber delivers the pulses to "a desired location".

In the Remarks page 6 lines 6-9, Applicant argues that the disclosure of Stock is "totally irrelevant to data transmission networks where peak power (generally far less than 1W) and distances involved are totally different". This argument is not persuasive. Applicant's claims do not quantitatively specify peak powers or distances. Further, Stock discloses send optical pulses from a source to a destination over single mode fiber, which concepts are highly relevant to fiber communication systems. One of

ordinary skill in the art at the time of the invention would know that in the variety of fiber data communication systems already known span essentially all known wired communication distances, from less than a meter (e.g. optical communication between electric devices in a rack) to hundreds of kilometers.

In the Remarks page 6 line 10 to page 7 line 5, Applicant argues against Moeller, specifically arguing against modifying Moeller to reduce non-linear effects. This argument is not persuasive because it does not address the rationale of the rejection, which is based on modification of Stock to transmit data, in view of a general concept from Moeller, regardless of the specific problem Moeller was concerned with. The rejection is not based on modification of Moeller, nor does it involve considering Moeller in isolation. The use of patents and patent application publications as references is not limited to what those patentees or applicants describe as their own inventions or to the problems with which they are concerned. They are part of the literature of the art, relevant for all they contain.

In the Remarks page 7 lines 6-22, Applicant argues against using Harstead in the combination because Harstead discloses pulse stretching in the context of WDM. However, the relevant general concept gathered from Harstead is that *linear* dispersion fiber can stretch pulses, regardless of the specific problem that Harstead was concerned with. The use of the Halstead patent as a reference is not limited to what Halstead describes as his own inventions or to the problems with which he was concerned. It is part of the literature of the art, relevant for all it contains.

In the Remarks page 8 lines 1-4, Applicant argues that Harstead's teaching is redundant. Either Applicant is here admitting that Stock already teaches linear dispersion fiber, or the linear fiber teaching from Harstead is not actually redundant, since Stock does not explicitly specify linear dispersion fiber. Further, the rationale involving Harstead is that simple substitution of linear dispersion fiber could be made for the fiber of Stocks' stretcher with predictable results. Applicant does not address this rationale.

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to NATHAN M. CURS whose telephone number is (571)272-3028. The examiner can normally be reached on 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ken Vanderpuye can be reached on (571) 272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/NATHAN M CURS/

Primary Examiner, Art Unit 2613